Solutions: Sampling Distributions Checkpoint 2

Question 1

Which of the following statements about the sampling distribution of the sample mean, x-bar, is correct?

    (a)   The distribution is normal regardless of the shape of the population distribution, as long as the sample size, n, is large enough.

    (b)   The distribution is normal regardless of the sample size, as long as the population distribution is normal.

    (c)   The distribution's mean is the same as the population mean.

    (d)   The distribution's standard deviation is smaller than the population standard deviation.

    (e)   All of the above statements are correct.

Correct answer: (e)

The next two questions refer to the following information:

Pictured below (in scrambled order) are three histograms: One of them represents a population distribution. The other two are sampling distributions of x-bar; one for sample size n = 5, and one for sample size n = 30.

Histogram 1:

Histogram 2:
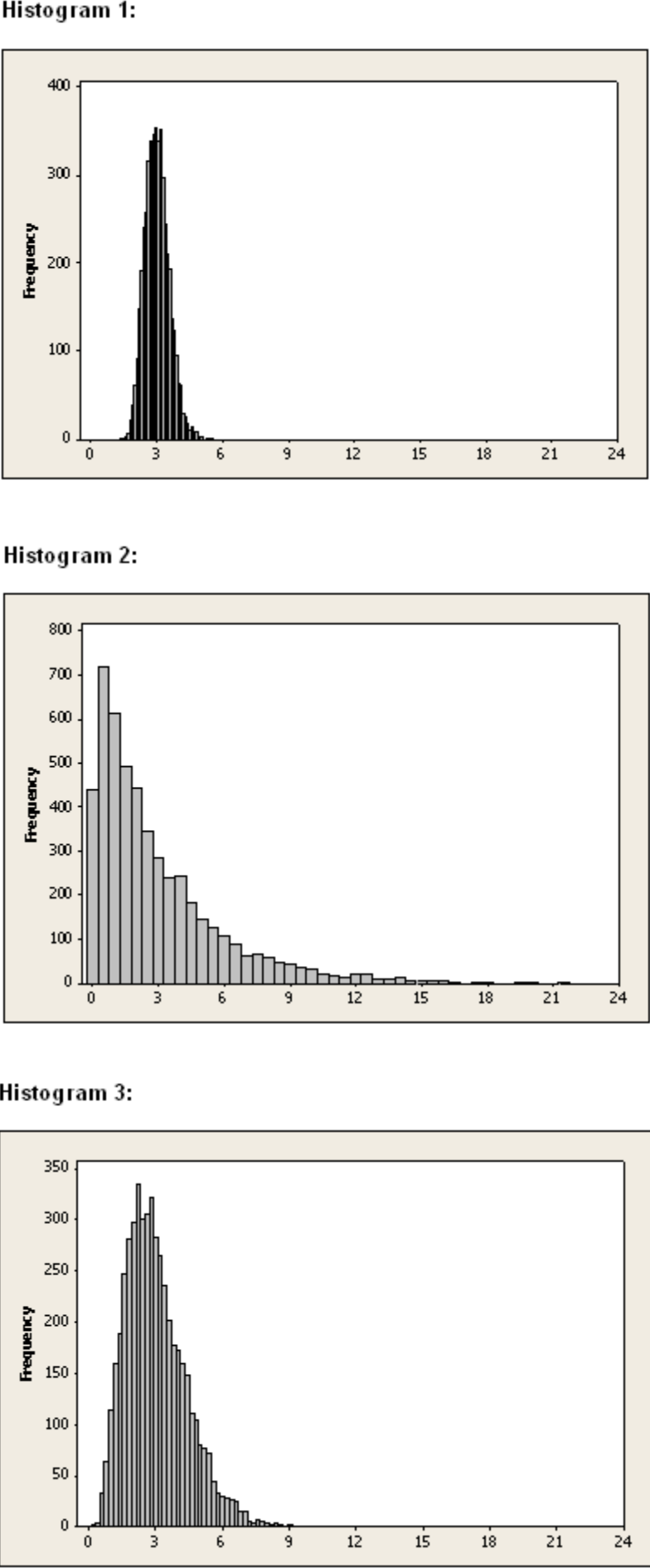
Histogram 3:

Question 2

Which of the following 6 possible orderings of the three histograms represents the sequence:
- Population distribution
- Sampling distribution of x-bar for sample size n = 5
- Sampling distribution of x-bar for sample size n = 30?

    (a)   histogram 1, histogram 2, histogram 3

    (b)   histogram 1, histogram 3, histogram 2

    (c)   histogram 2, histogram 1, histogram 3

    (d)   histogram 2, histogram 3, histogram 1

    (e)   histogram 3, histogram 1, histogram 2

    (f)   histogram 3, histogram 2, histogram 1

Correct answer: (d)

Question 3

Based on the histograms, the most likely value of the population mean is:

    (a)   0.5

    (b)   3.0

    (c)   4.5

    (d)   7.5

    (e)   350

Correct answer: (b)

Question 4

Suppose that a candy company makes a candy bar whose weight is supposed to be 50 grams, but in fact, the weight varies from bar to bar according to a normal distribution with mean μ = 50 grams and standard deviation σ = 2 grams.

If the company sells the candy bars in packs of 4 bars, what can we say about the likelihood that the *average* weight of the bars in a randomly selected pack is 4 or more grams **lighter** than advertised?

    (a)   There is no way to evaluate this likelihood, since the sample size (n = 4) is too small.

    (b)   There is about a 16% chance of this occurring.

    (c)   There is about a 5% chance of this occurring.

    (d)   There is about a 2.5% chance of this occurring.

    (e)   It is extremely unlikely for this to occur; the probability is very close to 0.

Correct answer: (e)

Save   Submit and finish